Welch Allyn®
Kreativ®

Mach 5.0 and Mach 5.0 PLUS Air Abrasion Units

Instructions for Use

Please read this manual thoroughly prior to first use

CAUTION: This device must only be purchased by, or sold to, a licensed dentist.

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Chapter

1

1. Introduction and General Information

Introduction

The Kreativ Mach 5.0 and Mach 5.0 PLUS systems are compact, highly reliable, state-of-the-art instruments designed for Air Abrasive MicroDentistry. They are designed as a means of removing tooth structure and other materials to prepare teeth for restoration, and as an adjunct to the high speed dental handpiece and bur. These instruments were developed after extensive consultation with dentists in order to provide the optimum performance, taking into consideration patient comfort and the time constraints faced by today's 21st Century dental office.

Note: Clinical use of the Kreativ Mach 5.0 and Mach 5.0 PLUS air abrasion systems for procedures not included or suggested in this instruction guide is not advised. Similarly, the Kreativ Mach 5.0 and Mach 5.0 PLUS systems should be only used by dental professionals who have practiced on extracted teeth and who are thoroughly familiar with this manual.

Purpose of this Manual

This manual should be thoroughly studied before installing and using the equipment. Please call your nearest authorized Welch Allyn / Kreativ service representative if you need additional information regarding installation, operation, or service of the instrument.

Information essential to the installation, operation, and routine maintenance of the Mach 5.0 and the Mach 5.0 PLUS devices manufactured by Kreativ, Inc., is included in this manual. The instructions are written specifically for personnel who have been trained in restorative and preventive dentistry.

A full selection of abrasive powders and nozzle sizes are available from your nearest Welch Allyn / Kreativ sales representative. See the listing of supplies in Chapter 8.

All serviced components, such as control valves and hose connections, can be easily accessed through the side doors of the instrument. A footswitch is provided to start the powder flow. The instrument features a mixing chamber which can be quickly unloaded in order to facilitate service, changing abrasive powders, or cleanup of the unit after use.

General Information and Features

The Kreativ Mach 5.0 and Mach 5.0 PLUS systems are designed to provide controlled flow of an abrasive powder and air mixture through a very precise nozzle. Applications include amalgam removal, cutting, abrading, deburring, peening and etching of tooth structures and other materials. Features of the Mach 5.0 and the Mach 5.0 PLUS air abrasion systems include:

Operating Modes

- PowerPulse™ - optimized to remove amalgam
- MicroPulse™ - for removal of tooth structure
- Continuous - for microetching procedures

Remote Control

- Continuously Variable levels controlled by the user:
  - Particle Energy (minimum is 30, maximum is 120), see Table 1 for psi-to-kPa conversion in Chapter 3
  - Beam Intensity (minimum powder is 0, maximum is powder 10)
- Remote Control module can be attached to dental units via an extension cable
- Easy to read LED display
- Visual and audible indicators
- Diagnostic/maintenance reminders
  - Replace pinch tube in Pinch Valve #1
  - Service Needed
  - Powder Low
  - Replace pinch tube in Pinch Valve #2
  - Empty Exhaust Bottle
  - Input Error
- Handpiece holder (bracket with sensor)

Interfaces with Dental Unit

- Remote Control offers movement of the control panel to the location of the dentist's choice, usually near other handpieces
- Keeps all controls at your fingertips
- Seamless integration of air abrasion with traditional dental instruments

Full Diagnostic

- At start-up
- Continuous monitoring

Additional Features

- Quickly detachable handpiece for easy sterilization
- Double doors for simplifying preventive maintenance
- Exhaust bottle container
- Easy pinch tube replacement
- Easy access to powder canister
- Accessory drawer for nozzles, handpieces, etc.
- Full range of operation from 30 psi to 120 psi
- Convenient handles
- Mobility
- Wide range of nozzles in sizes/angles and cutting capabilities
- Locked doors to prevent unauthorized access

Specifications

- Power Requirements:

  Domestic
  Mach 5.0 100-127 V~, 60 Hz, 400 mA
  Mach 5.0 PLUS 100-127 V~, 60 Hz, 6.5 A

  International
  Mach 5.0 220-240 V~, 50 Hz, 170 mA
  Mach 5.0 PLUS 220-240 V~, 50 Hz, 3.5 A

  NOTE: Verify unit has correct voltage for your application.

- Air Requirements:

  Mach 5.0, 80 to125 psi (550 to 860 kPa) with at least 1.5 cfm (42.5 l/min) recommended; the supply pressure must be at least 5 psi (35 kPa) greater than the selected operating pressure.

  The Mach 5.0 PLUS incorporates a built-in compressor which has an automatic thermal

cut-out if the head reaches approx. 212° F (100° C), and a thermal cut-in when the temperature drops to 140° F (60° C).

- Approximate Size: Mach 5.0, 12" x 18" x 8.5" (30.4 x 45.7 x 21.5 cm)

  Mach 5.0 PLUS, 25" x 18" x 8.5" (63.5 x 45.7 x 21.5 cm)

- Approximate Weight: Mach 5.0, 30 lbs. (15.9 kg)
  Mach 5.0 PLUS, 85 lbs. (38.6 kg)

- Environment Limitations:
  Operational Requirements:
  Temperature: 50° F to 95° F (+10° C to 35° C)
  Humidity: 30 % to 75 %
  Atmospheric pressure range: 10.15 psia (70 kPa) to 15.37 psia (106 kPa)
  Transport and Storage Requirements:
  Temperature: 14° F to 122° F (-10° C to 50° C)
  Humidity: 10 % to 90 %
  Atmospheric pressure range: 7.25 psia (50 kPa) to 15.37 psia (106 kPa)

- Equipment Classification: The Mach 5.0 and Mach 5.0 PLUS systems are Class I devices requiring an electrical earth ground. These devices are classified as ordinary with regard to protection against water ingress.

- Electrical Fuses: Littelfuse, SlowBlow

Model	Fuse Mfr	Mfr P/N	Kreativ P/N	Fuse Rating
Mach 5 115V	Littelfuse	Type 326-001	600089	1A, 250Vac
Mach 5+ 115V	Littelfuse	Type 326-010	600071	10A, 250Vac
or	Bussmann	Type MDA-10	600071	10A, 250Vac
Mach 5 230V	Littelfuse	Type 218-01.6	600096	1.6A, 250Vac
Mach 5+ 230V	Littelfuse	Type 218-06.3	600112	6.3A, 250Vac

- UL Canadian Classification Marking:

Air Abrasive Micro Dentistry Device, Model 9000-XX
(where XX can be any alphanumeric character)
WITH RESPECT TO ELECTRIC SHOCK, FIRE, MECHANICAL

Chapter 2

2. Safety

The Kreativ Mach 5.0 and Mach 5.0 PLUS systems are designed for use only by and on the order of a dentist.

Warnings

Always wear protective eye equipment in order to avoid corneal abrasion or irritation if particles are deflected into the eye. This applies to the dentist, staff, and patient.

A rubber dam is recommended in order to avoid injury to gingiva or other soft tissue, and for interproximal preparations to protect adjacent tooth surfaces.

Never direct the handpiece to an open pulp chamber or at pulpal exposures. Also never place the handpiece in direct contact with the gingiva when the air pressure is activated. While the abrasive stream will not cut the gingival tissue, it may irritate it.

All Kreativ Mach 5.0 and Mach 5.0 PLUS accessories which come into contact with the patient should be sterilized prior to each use. Always disinfect the handpiece cradle in the remote control unit before each patient use.

Always use your high volume evacuation system when using the handpiece of the Kreativ Mach 5.0 or Mach 5.0 PLUS. Have the dental assistant place the high volume evacuation system in close proximity to the operative site.

Make sure that the Kreativ Mach 5.0 and Mach 5.0 PLUS systems are connected to a properly grounded electrical outlet.

Always replace fuses with fuses of the proper rating, as indicated in the Chapter 1.

Cautions

For dental cleaning (prophylaxis) procedures, be absolutely sure that the chamber and hose have been completely cleared of all abrasive powders and use only bicarbonate in the chamber.

The handpiece should be directed precisely at surfaces and tooth structures which are to be modified or removed. The nozzle tip should be placed a few millimeters from the tooth and angled toward the area to be removed or modified. Unlike the high speed handpiece, the Mach 5.0 nozzle cuts only directly from the end; there is no side cutting.

Do not attempt to service the unit beyond those items described in the maintenance section. Call your nearest Welch Allyn / Kreativ service representative for instructions.

Practice on extracted teeth prior to utilizing the Mach 5.0 and Mach 5.0 PLUS on patients. Begin with the 27.5 micron aluminum oxide powder. Use only short bursts, carefully monitoring your progress. Most users prefer the 27.5 micron powder at a Particle Energy setting of 50 to 80 psi due to improved patient acceptance.

Do not substitute non-Kreativ, Inc., materials or accessories. Use of materials or accessories supplied by other manufacturers may result in damage to the unit and will void the factory warranty.

Use only clean dry air. Make sure that your air compressor system utilizes air dryer filter systems and that they are fully operational. Any moisture or oil in the air supply will adversely affect the performance of your Mach 5.0 or Mach 5.0 PLUS.

When using the Mach 5.0, check to be sure that your air system produces at least the minimum pressure and flow rate indicated in the Air Requirements section of the Specifications in Chapter 1.

Sound clinical judgment, good common sense and proper training are essential to the successful use of the unit in order to provide safe and efficient patient care.

Always follow "standard of care" protocols in performing dental operative procedures.

The handle on the top of the Mach 5.0 PLUS units is intended to be used to pull the units and is not meant for picking up the units.

Caution: Connecting the instrument's input air supply line to a water outlet will lead to damage to the instrument which is not covered under the limited warranty. Repairs for such damage are at the customer's expense.

Safety Markings on Labels

Alternating current

Protective earth (ground)

Attention, consult accompanying documents

Off (power: disconnection from the mains)

On (power: connection to the mains)

Type B equipment (defines the degree of protection against electrical shock)

Chapter

3

3. Controls and Connectors

The diagrams on the following pages illustrate the external controls, indicators, and connectors for the Kreativ Mach 5.0 and Mach 5.0 PLUS instruments.

In both the Mach 5.0 and the Mach 5.0 PLUS, the handpiece hose connects to a connector located under the Control Module.

The Control Module is removable from the front of the Mach 5.0 and the Mach 5.0 PLUS and can be attached to the Dental unit, as follows:

1. The Control Module is held to the front of the instrument by spring tension on the interconnecting cable. With the handpiece mounted in the cradle on top of the Control Module, the hose and the provided extension cable allow the Control Module to be remotely located up to 10 feet from the main unit. The connector to the air supply is located on the rear of the instrument.
2. A mounting plate with clamp is supplied with the Mach 5.0 and the Mach 5.0 PLUS, to be mounted on the dental unit.
3. The Control Module will attach to the mounting plate for use at the dental unit, remotely from the main instrument.

Item Descriptions

Refer to the Drawings in this section for the following items.

(1) On/Off Power Switch: turns power on or off to the entire instrument

(2) Power Cord Connector: connection point for the power cord.

(3) Fuse Box: the location of the instrument fuses. Always replace with the same type of fuse with the same rating, indicated in Chapter 1.

(4) Pneumatic Footswitch Connector: connection point for the dental chair pneumatic footswitch.

(5) Electric Footswitch Connector: connection point for the electrical foot-switch

(6) Air Supply: connection point for the office air supply to the instrument (Mach 5.0 only)

Control Panel

Air Indicator: indicates the status of the air pressure as "On" or "Standby"

Mode: indicates the operating mode of the instrument as "PowerPulse," "MicroPulse," or "Continuous." The power up default is PowerPulse

Beam Intensity: indicates the relative amount of abrasive powder that is being delivered to the handpiece nozzle

Warning Indicators: indicate the type of problem when operational problems occur

Particle Energy: indicates the pressure with which the abrasive powder is being delivered. Numbers in the display indicate Pounds per Square Inch (PSI).

Conversion Table of PSI to kPa

PSI	kPa	PSI	kPa
30	210	90	620
35	240	95	655
40	275	100	690
45	310	105	725
50	345	110	760
55	380	115	795
60	415	120	825
65	450	125	860
70	485	130	895
75	515	135	930
80	550	140	965
85	585		

Table 1

Drawings of Controls

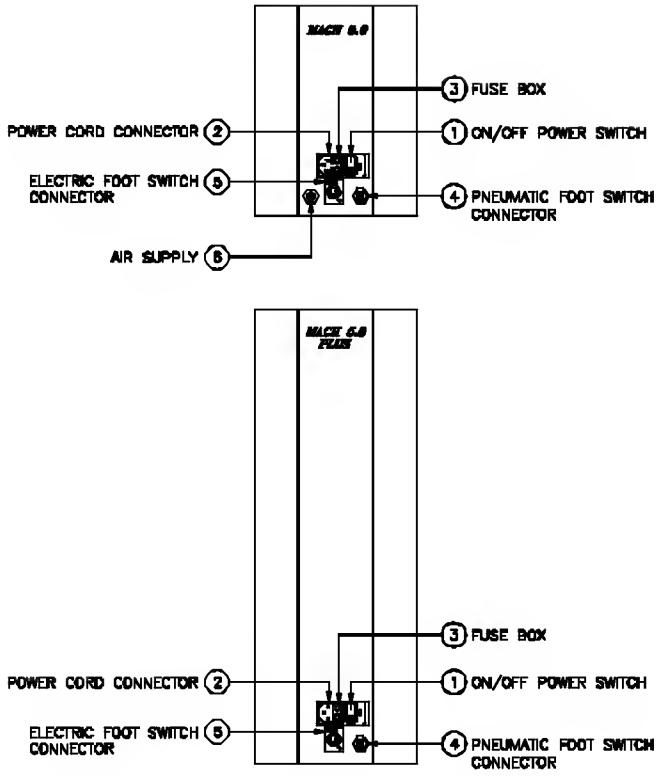


Figure 1

CONTROL PANEL

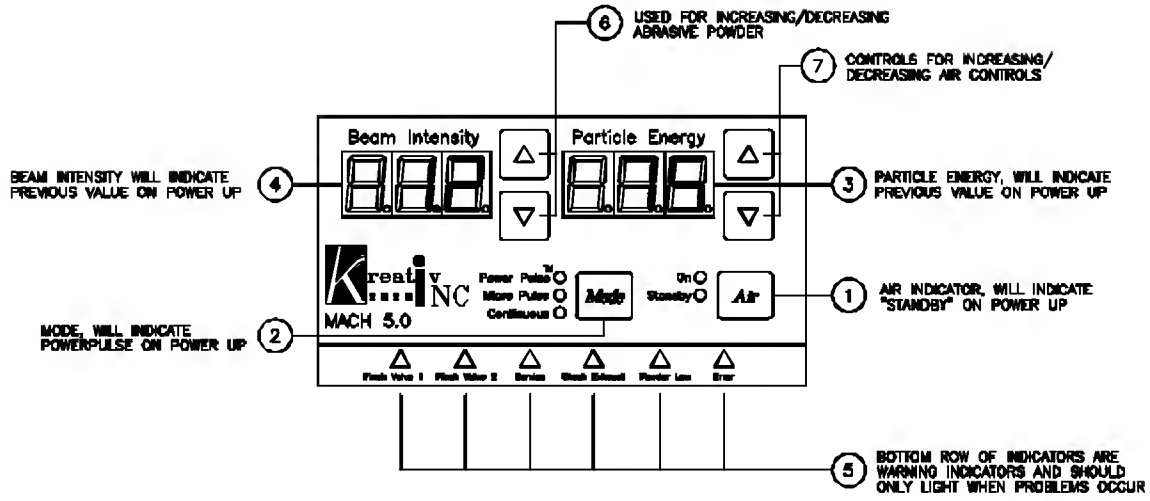

6 USED FOR INCREASING/DECREASING ABRASIVE POWDER
7 CONTROLS FOR INCREASING/ DECREASING AIR CONTROLS
Beam Intensity
Particle Energy
BEAM INTENSITY WILL INDICATE PREVIOUS VALUE ON POWER UP
4
3 PARTICLE ENERGY, WILL INDICATE PREVIOUS VALUE ON POWER UP
Kreative INC
MACH 5.0
Power Pulse
Micro Pulse
Continuous
Mode
On
Standby
Air
1 AIR INDICATOR, WILL INDICATE "STANDBY" ON POWER UP
MODE, WILL INDICATE POWERPULSE ON POWER UP
2
5 BOTTOM ROW OF INDICATORS ARE WARNING INDICATORS AND SHOULD ONLY LIGHT WHEN PROBLEMS OCCUR

Figure 2

Functional Description

When the unit is initially turned on, all lights on the Control Module will light and the Beam Intensity and Particle Energy windows will show "8.8.8." until the diagnostics are complete (indicating the unit is ready to operate). The values shown will be the previous settings used.

Kreativ Mach 5.0 and Mach 5.0 PLUS systems provide a controlled mixture of powder particles in a dry air stream and delivers this mixture through a nozzle.

Three primary paths are provided for the air supply within the unit. One is to the Exhaust Control Valve, another to the Abrasive Control Valve, and the third is through the Mixing Chamber and the Abrasive Control Valve Tube to the nozzle. In the mixing chamber, the stream of dry air is mixed with powder particles.

When the Air switch is set to "On", the On/Off Air Valve Switch allows the air to flow to the Mixing Chamber. With the footswitch depressed, the Abrasive Control Valve is opened. This opens the path for the stream of powder particles from the Mixing Chamber to the nozzle. The Beam Intensity and Particle Energy can be adjusted to provide optimum powder flow.

The air stream combined with abrasive powder has the ability to cut and etch tooth structure and ceramic. The abrasive powder/air stream is directed through a light, flexible hose to the handpiece for precise cutting. Various nozzles and handpieces are offered with different orifice sizes and angles to enable the practitioner to accomplish specific tasks. In addition, a selection of abrasive powder is available. Nozzle and abrasive powder types are listed in Chapter 9.

CAUTION: The unit should only be powered down with the Air control in "Standby" mode.

NOTE: The unit will automatically go into "Standby" if left unattended for approximately 10 minutes.

When the Power switch is set to Off, the unit automatically bleeds off the internal air pressure.

WARNING: Do not attempt to open the doors of the unit with power turned on!

Chapter

4

4. Unpacking and Setup

General Information

SAVE THE CARTON!

The Mach 5.0 and Mach 5.0 PLUS and all accessories are shipped in a single container. When unpacking, check items against the packing list included with the unit. ***The shipping container and packing materials should be retained in the unlikely event that the instrument has to be returned to the factory for service or repair.***

To operate the Mach 5.0, the unit requires an external source of either clean, dry, compressed air, or nitrogen together with a properly adjusted pressure regulator. For additional information consult your Kreativ, Inc. dealer.

The Mach 5.0 PLUS instrument has a built-in air compressor, thus eliminating the need for connection to an external air supply.

It is necessary to connect to a properly grounded electrical outlet.

Unpacking and Setup

Remove the Mach 5.0 or the Mach 5.0 PLUS unit from the shipping container and proceed as follows:

- Unlock and open the left side door gently.
- Remove the foam packing (2 pieces) which prevents the vibrator from moving during shipping. Retain the foam with the shipping box and packing materials. If the unit is to be shipped again, the vibrator support foam packing should be reinstalled to prevent possible damage to the vibrator and its mounts.

CAUTION: Failure to remove the foam packing will result in improper vibrator operation and powder flow.

- On Mach 5.0 PLUS only, remove the black plug from the air inlet on top of the compressor module, and replace with the included filter.

CAUTION: Failure to replace the black plug with the filter will result in low air condition, and damage to the compressor unit.

WARNING: The use of compressed oxygen as a gas supply for the unit presents the possibility of having a gas that supports flammability. Under NO circumstances should oxygen be used.

Air Supply Requirements (Mach 5.0 only)

For the Mach 5.0 only, be sure that the supplied air pressure and air flow volume to the unit meet the minimum Air Requirements indicated in the Specifications section in Chapter 1. Moisture filters must be used since compressed air lines may be contaminated with moisture, oil or dirt, which are detrimental to the performance and operation of the unit. Kreativ can supply a product (the Klean Pak) to assure a dry air supply.

Caution: Connecting the instrument's input air supply line to a water outlet will lead to damage to the instrument which is not covered under the limited warranty. Repairs for such damage are at the customer's expense.

Electrical Requirements

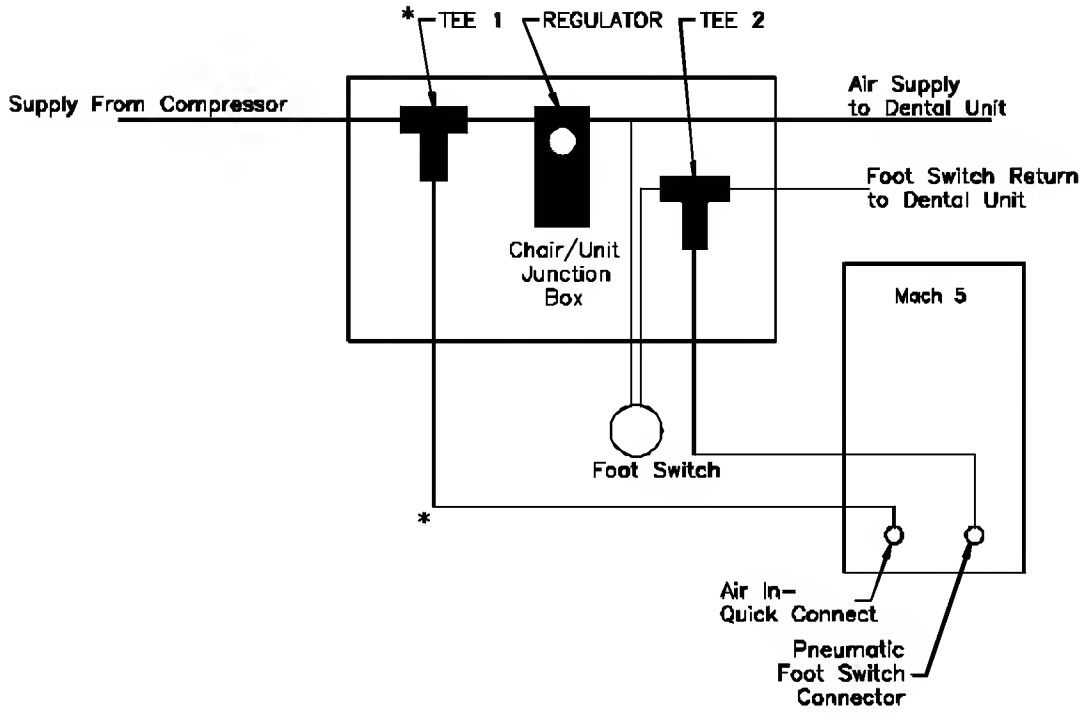
Reference the Specifications section of Chapter 1 of this manual for the power requirements of the unit. The power requirements of your instrument are located on the system label on the back cover of the instrument. Verify the unit is set up correctly for your electrical supply. When replacing fuses, only use fuses supplied by Kreativ in your customer kit. If your requirements are different, consult Kreativ, Inc., or your dealer before operating this instrument.

Mach 5.0/Dental Chair Pneumatic Integration

Please refer to Figure 3.

1. Depress chair foot switch while holding foot switch air line. The tube you feel pulsing is the "foot switch return" line, mark it for later reference (step 5).
2. Close valve from office compressor to dental chair/unit and bleed pressure from line.
3. Install "Tee 1" on line from compressor to dental unit before the regulator.

4. Route line from "Tee 1" to Mach 5.0. Install female quick disconnect to end and connect to Mach 5.0 "Air In" port.
5. Install "Tee 2" on return line from foot switch.
6. Route line from "Tee 2" to Mach 5.0. Install male quick disconnect to end and connect to Mach 5.0 "Foot Switch" port.
7. Open valve from compressor to restore pressure to the Dental chair/unit.
8. Check new connections for leaks.



Caution: When used in this manner, it is important to return the handpiece to the holder prior to using other devices.

***Not required for the Mach 5.0 PLUS with compressor.**

Figure 3 - Dental Chair Pneumatic Integration Diagram

Chapter

5

5. Installation and Unit Checkout

After completing the instructions in Chapter 4 you are now ready to install your Kreativ Mach 5.0 or Mach 5.0 PLUS. Refer to the drawings and descriptions in Chapter 3 for the identification of the external controls and connections.

Pre-Installation Requirements

- Adequate Air Supply, Mach 5.0 only. The most convenient set up will be to integrate the Mach 5.0 into your Dental unit as explained in the previous section. If you choose to hook up to your in-office air do the following:

  1. Ensure that you have at least the minimum air pressure and air flow volume of clean, dry air (see Chapters 1 and 4 for Air Supply Requirements). Refer to the Site Preparation information supplied by Kreativ. Ideally, air for the Mach 5.0 will be obtained by placing a "Tee" fitting prior to the final regulator at the operatory, but after the dryer, traps and various filters.
  2. If clean, dry air of adequate pressure and volume is not available, Kreativ recommends using compressed Nitrogen with a regulator (Follow integration instructions).

- Power supply/earth grounding. Note: route the power cord safely out of the way and do not use an extension cord.

Unit Checkout

- Set the Power Switch on the back of the instrument to OFF.
- On the Mach 5.0, connect the end of the air supply hose with the quick disconnect to the external air supply.
- Plug the power supply cord into a properly grounded receptacle.
- Set the Power Switch on the back of the instrument to ON. The Control Module should now be illuminated.

When first turned on, all lights on the Control Module will flash until the diagnostics are complete, indicating that the unit is ready to operate. The values shown will be the values from the last operation.

CAUTION: If the Control Module does not illuminate, it indicates absence of electrical power. Verify that power is available and the fuses are correct. If the Control Module still does not illuminate, call your nearest authorized Welch Allyn / Kreativ service representative.

- Verify that a handpiece/nozzle is attached to the delivery hose.
- Plug the hose assembly into the front of the unit.
- Lift the handpiece from its cradle and actuate the footswitch. Air should flow from the nozzle. Do not actuate the footswitch while the handpiece is in the cradle.

WARNING! Some residual powder may be in the unit from factory testing. Always use goggles or protective eyewear when using the Kreativ Mach 5.0 or Mach 5.0 PLUS systems and do not direct the nozzle towards the face when operating the footswitch.

WARNING! Before filling the mixing chamber, with the Air Control Switch in STANDBY, set the Power Switch on the back of the instrument to OFF. This depressurizes the system.

- Select the desired powder for the operation to be performed and proceed to fill the mixing chamber as described in the following section.

Filling the Mixture Chamber

The unit must be powered down as described above. Failure to do so will prevent the removal of the mixing chamber lid.

- Using the key, open the door on the **left** side of the instrument as you face the front of the instrument.
- Tilt the mixing chamber towards you, allowing access to the lid.
- Clean off any dust or debris from the mixing chamber lid.
- Remove the mixing chamber lid by turning the lid counterclockwise.
- Carefully pour abrasive powder into the mixing chamber until it is 3/4 full.
- Replace the chamber lid and hand tighten.
- Tilt the powder chamber back into the unit and close the access door.

- Lock both doors, removing key.

CAUTION: Make certain that no lint, dirt, or other foreign substances enter the chamber. This can result in plugging the unit. Failure to turn the power off will prevent removal of the mixing chamber lid.

Operational Checkout

- Place the Power Switch to ON and make sure the Particle Energy indicator is set to the desired setting. If not, change it by touching the up or down arrow accordingly. A Particle Energy setting of 80 is suggested when first using the instrument.
- Set the Beam Intensity to the desired setting, adjusting it up or down by touching the appropriate arrow. A suggested beginning setting is 7.0 for the Beam Intensity.
- Touch the Air control to ON.
- **Lift the handpiece from the cradle. If the handpiece is not in the cradle, the microswitch on top of the Remote must be depressed before the footswitch is activated.**
- Press the footswitch to obtain powder flow through the nozzle.

You can now practice operative procedures on extracted teeth as described in Chapter 2, Safety.

Footswitch Operation

- Depressing the footswitch enables the powder to flow through the handpiece/nozzle.

Unit Shutdown

- Set the Air Switch to the Standby position.
- Set the Power Switch to the OFF position.

Mixing Chamber Powder Unloading

- Follow unit shutdown instructions above.
- Unlock the left door and open.
- Loosen the black knob holding the block in place. The block will rotate down, releasing the mixing chamber so it can be removed for emptying.
- Firmly hold the chamber and loosen the mixing chamber lid by turning it counterclockwise.

- Completely unscrew the lid from the mixing chamber.
- Turn the mixing chamber over to empty it into a container for re-use.
- Replace the lid, making sure the threads are free of powder and the lid gasket is seated properly. Hand tighten the lid securely.
- Replace the mixing chamber into its original position.
- Replace the block holding the chamber, tightening the black knob securely.
- Check the two air hoses that attach to the mixing chamber to assure that they are not kinked or pinched and that they make a large, free loop.
- Close the door and lock it.

Chapter

6

6. Sterilization Procedures

WARNING: All Kreativ Mach 5.0 and Mach 5.0 PLUS accessories which come into contact with the patient should be sterilized prior to each use. The handpiece cradle should be wiped with disinfectant prior to each patient use.

Handpiece

Sterilization of the cutting handpiece and nozzles can be accomplished by using any conventional dental autoclave. The handpiece and nozzles are fully autoclaveable in a dry heat, steam, or chemical autoclave. This is recommended prior to each use to ensure that the handpiece and nozzles do not become a source for cross contamination of disease or infection.

Prior to sterilizing, the SuperSonic Turbo™ (SST) Handpiece Assembly should be cleared of all residual powder by blowing clean, dry air through the handpiece.

Handpiece Cradle

Always wipe down the handpiece cradle in the remote control unit before each patient use to avoid contamination of the handpiece from an earlier patient session.

WARNING! Do not attempt to disassemble the SST Handpiece Assembly.

Accessories

The handpiece/nozzle hose assembly of the Kreativ Mach 5.0 and Mach 5.0 PLUS should be sheathed or wiped down in accordance with standard dental procedures.

Powder

It is recommended that only GammaPure® treated powder be used with the Mach 5.0 and Mach 5.0 PLUS air abrasion systems. Additional GammaPure powder can be ordered from your Welch Allyn / Kreativ sales representative. Refer to the accessories list in the back of this manual.

Chapter

7

7. Routine Maintenance

Proper maintenance of the Mach 5.0 and Mach 5.0 PLUS systems is necessary to maintain a consistent cutting efficiency and top performance. Maintenance is limited to general cleaning, inspecting internal components, pinch tube replacement, emptying exhaust bottles, and keeping the powder chamber dry. The following are maintenance procedures categorized by their required frequency.

Daily Requirements

Powder Chamber

- Open the powder chamber. Observe the powder level and refill as necessary. Remove and clean the white lid gasket thoroughly before replacing the lid. Thoroughly clean all mating surfaces. Tighten the lid ring to avoid air leaks. Refer to Chapter 5 for detailed instructions.

Exhaust bottle

- The exhaust bottle should be emptied daily, and every time the powder chamber is filled. It is important to make sure the internal filter is clean and tight. If the filter is not tight, it should be removed and cleaned. Pay extra attention to cleaning all threads and mating surfaces. Do not let the bottle overfill.

Weekly Requirements

Powder Chamber

- Inspect the powder chamber for moisture contamination. Look for powder clumps or wet powder and replace as necessary. Refer to Chapter 5 for detailed instructions.

Exhaust bottle

- Remove and clean the exhaust bottle filter. When replacing, make sure all threads and mating surfaces are clean and tight.

Pinch tubes

- There are three pinch tubes inside three pinch valves located between the exhaust bottle and the powder chamber. Remove the pinch tubes by removing two thumb screws and the black cover block. Pull the tube from the hose assembly. Inspect

the tubes for signs of wear and replace with new tubes as necessary. Realign the pinch tube assembly with the grooves and securely tighten the thumb screws.

Monthly Requirements

Compressor Oil (Mach 5.0 PLUS only)

- The Mach 5.0 PLUS is equipped with a portable compressor that does not require general maintenance, except adding oil. The compressor is equipped with a viewing window with a minimum/maximum indicator line. If the oil is below the minimum line, add oil as follows;

    1. Ensure the unit power is off and the power cord is removed.
    2. Open the access door on the right side of the unit.
    3. Remove the oil fill bolt from the top of the compressor head.
    4. Using the bottle of oil and extra tubing shipped in the accessory kit, install the tubing to the top of the oil bottle to allow access to the oil fill hole. Squeeze small amounts of oil at a time, allowing time to settle before rechecking the level indicator. DO NOT OVERFILL.
    5. Replace top bolt and ensure it is tight.

Oil overflow bottle (Mach 5.0 PLUS only)

- Locate the clear oil overflow bottle at the bottom shelf of the Mach 5.0 PLUS unit. Inspect the level of oil, and empty as necessary. Excess oil should be disposed of as you would automobile motor oil.

Internal tubing

- Inspect internal tubing for wear and air leakage. Listen for audible leaking sounds and look for powder accumulation internal to the unit. Soapy water and a small paint brush is ideal for finding small air leaks. If a powder leak occurs, inspect the tubing going from the pinch valves to the exhaust bottle first, paying particular attention to any "Y" fittings. If no damage is found, make sure the exhaust bottle is empty, the exhaust bottle filter is clean and tight, and excess powder is cleaned from the unit. Clean up excess powder to avoid contamination of other components and to help isolate the leak area.

Handpiece Nozzles

- Inspect all the handpiece nozzles for wear, paying close attention to the carbide insert at the end of the tip. If there are any slits or chips, replace the nozzle. A worn nozzle will greatly effect the performance of cutting and powder flow control. It is possible to have a worn nozzle without any visible signs.

Chapter

8

8. Troubleshooting

The following table is intended to assist in communicating with your nearest authorized Welch Allyn / Kreativ service representative.

Troubleshooting Tips

PROBLEM	POSSIBLE CAUSE	REMEDY
"Lo Air" message momentary warning displays on Mach 5.0	• Air supply drops below the selected setting during operation	• Reduce the setting or increase the supply or wait for additional supply capacity
	• Handpiece is removed	• Install handpiece
	• Nozzle is removed from the handpiece	• Install the nozzle on the handpiece
"Lo Air" momentary message displays on the Mach 5.0 PLUS	• The compressor intake plug is still installed from shipping	• Remove the plug and install the pre-filter
No Power	• Instrument not plugged in	• Check Plug
	• Main Switch OFF	• Check Switch
	• Blown Fuse	• Change Fuse with specified fuse
	• Main Switch Bad	• Call local service rep.
		• Check Connection
	• Remote Not connected	• Check Facility Power Box
	• Blown Circuit Breaker	
No powder flow when footswitch is activated	• Footswitch not plugged in	• Check connection
	• Particle Energy not selected	• Check LED display
	• Handpiece/nozzle clogged	• Check for clog
	• Handpiece inoperable	• Check micro-switch on top of control

	• Tubing pinched	panel
	• Mixing Chamber empty	• Check tubing
		• Refill Mixing Chamber with powder
	• Air Valve problem	• Call local service rep
	• Clogged orifice in Chamber	• Disassemble and clean Chamber
Air flow from nozzle when footswitch is not depressed	• Loss of air pressure due to a misadjusted air valve regulator	• Call local service rep
	• Faulty footswitch	• Call local service rep
	• Pinch Valve block is not tight	• Tighten thumb screws
Erratic powder flow	• Powder caking in chamber	• Replace powder
	• Chamber empty	• Check powder level
	• Nozzle partially clogged	• Check nozzle
	• Vibrator inoperative	• Call local service rep
	• Moisture in air line	• Check filters, replace powder
	• Blown pinch tube	• Change pinch tubes
Powder spray loses definition	• Worn nozzle tip	• Replace nozzle
	• Too much distance from cutting surface	• Move closer
Excessive powder inside of unit	• Hole in tubing.	• Replace tubing
	• Hole in pinch tube	• Replace pinch tube
	• Exhaust bottle filter loose	• Tighten or replace filter
Remote error light turns on when foot switch is pressed	• Remote handpiece micro switch was not pressed	• Toggle micro switch

Error Codes

The following are possible error codes that may appear on the control panel for the unit. Follow the guidelines from the list above, cycle the power to the unit or call your nearest authorized Welch Allyn / Kreativ service representative.

Error Code	Description
E01	Processor check during power up initialization
E02	+12V status error condition
E04	EEPROM memory status error condition
E05	Zero crossing sensor if idle or if not 50 Hz or 60 Hz
E06	Control panel communications port error
E07	Pressure switch (should be open)
E08	Pressure sensor did not release
E09	Pressure sensor over-range condition
E10	Pressure sensor reads pressure even when solenoid is open
E11	+12V power drops excessively
E13	Bleed valve failure "Pin 3" (solenoid won't lower air pressure)
E14	Pressure won't increase above 40 on power up
E15	Excessive pressure abrading - stuck solenoid or circuit

Chapter

9

9. Handpieces/Nozzles and Abrasives

Standard Nozzles

Kreativ offers five nozzle sizes. The size indicates the diameter of the orifice with color codes to ease identification. Also, each size is offered with the tip at 90°, 67°, or 45° angles.

- 0.011 inch / 0.28 mm ID, Gray
- 0.014 inch / 0.36 mm ID, Green
- 0.018 inch / 0.46 mm ID, Blue
- 0.026 inch / 0.66 mm ID, Brown
- 0.032 inch / 0.81 mm ID, Black

SuperSonic Turbo (SST) Tipped Handpiece Assemblies

This patented nozzle design is for rapid cutting and amalgam removal. They are offered with the same 90°, 67° or 45° angle selection.

WARNING! Do not attempt to disassemble the SST Handpiece Assembly.

Sizes Available:

- 0.011 inch / 0.28 mm ID, Violet
- 0.014 inch / 0.36 mm ID, Gold
- 0.018 inch / 0.46 mm ID, Red

Abrasives, GammaPure® (Gamma Treated)

- 27 micron Aluminum Oxide, white color
- 27.5 Micron Aluminum Oxide, gray/brown color (recommended)
- 34 Micron Aluminum Oxide, white color

- 50 Micron Aluminum Oxide, white color

Ordering Information

- 170009-1 .011"/ .28mm @ 45° Gray Assy.
- 170009-2 .011"/ .28mm @ 67.5° Gray Nozzle Assy.
- 170009-3 .011"/ .28mm @ 90° Gray Nozzle Assy.
- 170010-1 .014"/ .36mm @ 45° Green Nozzle Assy.
- 170010-2 .014"/ .36mm @ 67.5° Green Nozzle Assy.
- 170010-3 .014"/ .36mm @ 90° Green Nozzle Assy.
- 170011-1 .018"/ .46mm @ 45° Blue Nozzle Assy.
- 170011-2 .018"/ .46mm @ 67.5° Blue Nozzle Assy.
- 170011-3 .018"/ .46mm @ 90° Blue Nozzle Assy.
- 170012-1 .026"/ .66mm @ 45° Brown Nozzle Assy.
- 170012-2 .018"/ .66mm @ 67.5° Brown Nozzle Assy.
- 170012-3 .018"/ .66mm @ 90° Brown Nozzle Assy.
- 170013-1 .026"/ .66mm @ 45° Black Nozzle Assy.
- 170013-2 .018"/ .66mm @ 67.5° Black Nozzle Assy.
- 170013-3 .018"/ .66mm @ 90° Black Nozzle Assy.
- 170053 .018"/ .46mm @ 45° Supersonic Handpiece, Red
- 170059 .018"/ .46mm @ 67° Supersonic Handpiece, Red
- 170060 .018"/ .46mm @ 90° Supersonic Handpiece, Red
- 170061 .014"/ .36mm @ 45° Supersonic Handpiece, Gold
- 170062 .014"/ .36mm @ 67° Supersonic Handpiece, Gold
- 170063 .014"/ .36mm @ 90° Supersonic Handpiece, Gold
- 170064 .011"/ .28mm @ 45° Supersonic Handpiece, Violet
- 170065 .011"/ .28mm @ 67° Supersonic Handpiece, Violet
- 170066 .011"/ .28mm @ 90° Supersonic Handpiece, Violet
- 170068 Mach 5.0 Chair Integration Kit
- 200002 Standard Handpiece
- 8000-1 Klean Air II, Domestic
- K01-00325-1 Pinch Tube Kit

- K99-00002-1 Protective Goggles (3 pair)
- 140007 Cart, Mach 5.0
- K01-00398-1 Cart, Mach 4
- 120000 Klean Pak, Cartmount
- K01-00291-2 50 Micron Powder
- K99-00003-2 27.5 Micron Powder, Brown (recommended)
- 140000 34 Micron White Powder/ 2-2# Pkg
- 140001 27 Micron White Powder/ 2-2# Pkg.

Kreativ also offers a complete line of composites and other restorative materials. Call your Welch Allyn / Kreativ sales representative for more information.

Chapter

10

10. Recycling

Recycling Instructions for Device, Accessories and Packaging

Device

- Internal housing shell and brackets should be recycled as steel, or aluminum.
- Plastic parts should be removed from the metal pads before recycling (e.g., power appliance inlet, footswitch connector, main switch).
- All printed circuit boards should be recycled as electronic devices.
- Doors, skirt and top cover should be recycled as plastic.

Accessories

- All spare parts should be recycled according to the instructions above.
- Products which have been in contact with the patient need to be cleaned as described in the Owner's manual.

Packaging

- The carton, all other plastics and inserts should be recycled (cardboard, foam, polyethylene)

ALL RECYCLING MUST BE IN COMPLIANCE WITH THE RELEVANT NATIONAL LAWS. GOVERNMENT AUTHORIZED RECYCLING CENTERS MUST BE USED.

Environmentally Relevant Material

COMPONENTS	LIST OF MATERIALS
ENCLOSURE AND ALL BRACKETS	• STEEL • ALUMINUM
PRINTED CIRCUIT BOARDS	• EPOXY • FR4
DOORS, TOP COVER, SKIRT (PLASTIC)	• FR ABS
TUBING	• URETHANE

THERE ARE NO HAZARDOUS MATERIALS PRESENT

Chapter

11

11. Warranty, Returns and Adjustments

Returns and Adjustments

Warranty claims must be made promptly and received by your nearest authorized Welch Allyn / Kreativ service representative during the warranty period. The liability of Kreativ Inc., under valid warranty claims, is limited to repair or replacement at the purchaser's authorized Service Center or the purchaser's place of business, at the option of the authorized service representative. If it is necessary to return a product for repair or replacement, authorization for the return must first be obtained from the authorized service representative.

All products returned for examination or warranty repair must be sent insured via a means of transportation specified by the authorized service representative.

Kreativ, Inc., or its authorized service representative claims the sole responsibility for determining the cause of any instrument failure and the adjustments are subject to Kreativ, Inc approval.

Limited Warranty

Kreativ Inc. warrants the equipment to be free from defects in material and workmanship for a period of 12 months from the date of shipment. Damage due to failure of customer to perform required user/preventive maintenance is not warranteed. Certain components having limited life expectancy (pinch tubes, air/abrasive tubing, handpieces and handpiece tips) are not warranteed against normal wear and tear or customer damage. This limited warranty applies only to the original purchaser / user of the equipment.

The foregoing limited warranty is exclusive and in lieu of all other warranties, whether written, oral, or implied, and shall be purchaser's sole remedy and Kreativ's sole liability under contract or warranty or otherwise for the product.

Kreativ, Inc., disclaims any implied warranty of merchantability or fitness for particular purposes. In no event shall Kreativ, Inc. be liable for any incidental or consequential damages, or for any incidental or consequential damages arising out of, or in connection with, the use or performance of the product delivered hereunder.

Storage And Shipment

The Kreativ Air Abrasion dental instruments have been designed for long term usage in normal dental office environments. If it is to be stored for any reason for a long period, it should be covered to protect it from adverse conditions. The area it is to be stored in should meet the Environmental Limitations Transport and Storage Requirements indicated the Specifications section of Chapter 1.

The unit has been designed for shipment by normal commercial carriers. Protective packaging should be used, and the original packing materials should be reinstalled for shipment. Shipping instructions must be followed closely. The purchaser will be responsible for damage resulting from improper packing.